Abstract of the Disclosure

A plasma discharge electrode having a front surface with a central portion thereof including gas outlets discharging a process gas which forms a plasma and a peripheral portion substantially surrounding the gas outlets. The peripheral portion has at least one step for controlling a density of the plasma formed by the electrode. The electrode can be used as the grounded upper electrode in a parallel plate plasma processing apparatus such as a plasma etching apparatus. The geometric features of the step and of a corresponding edge ring on the lower electrode can be varied to achieve the desired etch rate profile across a wafer surface.